From urban tips to extractive territories: reformulating the waste issue

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Background

As the mass of by-products generated by human activity reaches the point of outstripping the planet's biomass in its entirety, exceeding a 5th planetary limit in the process (largely as a result of the proliferation of microplastics in the oceans, which are rapidly becoming clogged up with junk), now more than ever we need to rethink our society's relationship with materiality. The issue of waste – long neglected, now unavoidable – is in need of reformulation. The materiality of our lives is generally "coded" in terms of waste by the producers themselves, and it is left to each individual to "decode" this information. In this article we propose to "recode" it, i.e. to reformulate it in an original manner which makes clear the connections between urban tips and the mines at the origin of the consumption cycle. This reconfiguration opens up new questions which get to the heart of sustainability science (tackling the causes of problems, developing a holistic approach), and allows us to make some suggestions for concrete action.

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Further reading

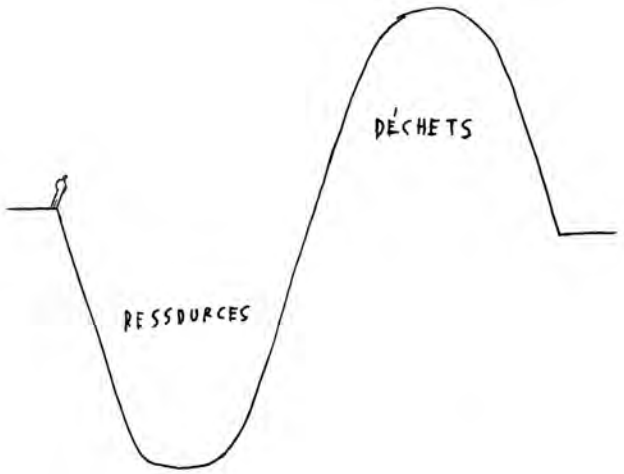
Elhacham E. et al., 2020 – Global human-made mass exceeds all living biomass. *Nature*, 588 : 442-444.
Haberl H et al., 2019 – Contributions of sociometabolic research to sustainability science. *Nat Sustain*, 2 : 173-184.

From rudology to socio-metabolism

From the Latin *rudus* (debris), "rudology," the science of waste, was founded in 1985 by French geographer Jean Gouhier. It concerns itself with the study of refuse, those things we shun and discard, and with the conditions and assumptions behind this rejection. It is a pluri-disciplinary approach spanning the human and social sciences (geography, sociology, economics etc.) in order to explore the polarities revealed by the circulation of different forms of waste, primarily of household origin. Formerly regarded as a pioneering approach, rudology is no longer fit for purpose in light of the unsustainable proliferation of waste in all of the planet's milieus: terrestrial, fluvial, marine, oceanic, atmospheric and even orbital. All of which leads us to the following hypothesis: studying that which is left behind when the economic system reaches the "end of the line," focusing exclusively on downstream technical solutions, leads us into an analytical and operational impasse. We thus propose a shift of perspective. We need to turn our attentions further upstream, reconsidering the socio-metabolism in its entirety. Borrowed from biology, this term is applied to the quantitative study of physical flows within a socio-economic system (Haberl et al., 2019). Socio-metabolism allows us to resituate the issue of waste within a more systemic understanding of how our societies function in sheer material terms. To do so, we must be clear about the connections between downstream processes of surplus disposal and upstream processes of resource extraction. It is essential to bear in mind that the mountains of waste which continue to grow all over the world are inseparable from the mines dug to extract more resources. These two phenomena are two sides of the same coin, leaving lasting scars on our territories.

Complication no. 1: The hidden footprint of things

Attempting to understand waste solely in terms of municipal refuse is grossly misleading as it overlooks the biggest source: industrial waste, which is 18 times greater than household waste. The average resident of the Greater Paris region consumes 6.5 tonnes of products each year (visible consumption). In reality, however, the average material footprint is three times greater (20 tonnes/year) when we include all of the materials used upstream in the process of manufacturing those goods. The "material footprint" encompasses all of the natural resources used in the production of a specific good. The quantity of material displaced or utilised in this process far outweighs the mass of the finished product. We thus need to shift our focus away from household waste, and instead consider the total material footprint of the things we use and consume. This shift requires us to look more closely at the issue of mining waste, an industry where reject rates of 99% – perhaps even 99.9% – are common. Digging up the earth's crust is first and foremost a gigantic exercise in waste creation. And yet the handling of mining waste, which can be highly toxic in some cases, is anything but ideal. Striking examples can be found in the deadly, polluting mudslides seen in Brazil (Minas Gerais) in 2015 and 2018.



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(taken from *Matière grise*, 2014, Éditions du Pavillon de l'Arsenal).

Complication no. 2: Dismantling urban mines

The term "urban mine" is generally used to describe the potentially useful resources found in our waste, particularly household waste. For example, discarded mobile telephones constitute a vast reservoir of precious metals. In theory, retrieving and recycling these metals would reduce the demand for virgin materials while also reducing our waste problem. "Socio-metabolism" is enlightening in this respect, since it serves to remind us that a large proportion of the materials extracted upstream in the process do not immediately become waste. Each year, 31 billion tonnes of materials extracted from the critical zone (the Earth's outer layer, defined by the chemical interactions between air, water and rock) are initially used in relatively permanent buildings and infrastructure (immobilising these resources for several decades). The volumes involved are such that the total mass of anthropogenic artefacts which make up our urban environments is close to outstripping total planetary biomass (Elhacham et al., 2020). This is an unprecedented tipping point in human history, and the greatest concentration of mined resources is found in urbanised areas. This stock of extracted, transformed materials (in the form of buildings, infrastructure, networks, industrial facilities, vehicles, electrical appliances etc.) constitutes an urban mine of "secondary" materials to be utilised. The challenge we face is to rethink the infrastructure of the fossil economy, viewing these artefacts as objects to be "unpicked," an old world to be broken up. How do we go about organising this great dismantling?

KEY POINTS

The perspective offered by socio-metabolism is enlightening in several respects. To begin with, it highlights the major problem posed by the declining liveability of the critical zone: upstream, the extraction of materials from the earth's crust has reached unprecedented proportions with severe consequences for biodiversity; downstream, the massive scale of waste gives the lie to the circular economy discourse, since fewer than 10% of the materials we use are currently recycled. This perspective also highlights the exaggerated emphasis placed upon household waste, particularly in the human and social sciences, when in reality it accounts for less than 10% of total man-made refuse. Finally, our urban environments constitute an enormous reservoir of potential resources, which continues to grow by 31 billion tonnes each year. Indeed we have reached the point where anthropogenic artefacts are close to exceeding, in terms of sheer mass, the entirety of the planet's biomass.

SUSTAINABILITY SCIENCE

UNDERSTAND, CO-CONSTRUCT, TRANSFORM

Volume 2

Collective thinking coordinated
by Olivier Dangles and Marie-Lise Sabrié

IRD Éditions

French National Research Institute for Sustainable Development
Marseille, 2023

D2S follow-up of the articles: Claire Fréour and Magali Laigne
Editorial coordination: Marie-Laure Portal-Cabanel
Cover: Charlotte Devanz
Design and layout: Aline Lugand

Cover photo: Rock painting, Cueva de las Manos, Argentina.
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PDF version ISBN: 978-2-7099-3003-1